

TABLE IV

Group #	Mouse #	Excision	Bleomycin	EP
9	9-1	Complete tumor removal		
	9-2	X		
	9-3	X		
10	10-1	X (at 2 hr)	X	X
	10-2	X (at 2 hr)	X	X
	10-3	X (at 2 hr)	X	X
11	11-1	X (at 24 hr)	X	X
	11-2	X (at 24 hr)	X	X
	11-3	X (at 24 hr)	X	X

[0081] The animals of Group 9 were anaesthetized followed by complete excision of the tumors. The tumors were examined for consistency and preserved in formalin for later histological evaluation, as were the tumor tissues of cohorts 10 and 11. Anaesthetized animals of cohort 10 were subjected to intratumoral administration of Bleomycin solution at a dose and volume as described above. EP was performed 10 minutes after drug administration. Tumors were excised 2 hrs after EP. Animals of cohort 11 were treated as those in cohort 10 except that their tumors were completely removed at 24 hrs after EP. All wounds were closed as described above.

[0082] Results

[0083] With respect to the above cohorts 1 to 8 we examined the rate of recurrence of the tumors in the test animals three weeks after treatment. As disclosed in Table V and FIG. 15, the majority of animals receiving Bleomycin and EP were protected from tumor recurrence. (see description of FIG. 15 for definitions of abbreviations therein).

TABLE V

Group #	Tumor excision			Route of administration of Bleomycin			% efficacy*
	complete	partial	none	EP	i.v.	intratumoral	
1	+			+	+		90
5	+			+		+	100
7		+		+		+	100
6			+	+		+	80
3		+		+	+		67
8			+	+/-**		+	67
2	+			-			0
4		+		-			0

*% efficacy is based on the number of test animals in each Group that did NOT experience tumor growth post treatment

**+/- represents a partial EPT procedure wherein the treatment was off-centered from the tumor/tumor bed.

[0084] Specifically, Groups 1 to 8 provide results indicating that treatment of tumor bed tissue provides an unexpected and surprising benefit in protecting the animal from recurrent tumors at the site of the treatment. As shown by the data, excision alone is not effective, whether the tumors were completely or partially removed. This is likely due to the aggressive nature of the tumor type used which left invasive tumor segments and/or micrometastases at or close to the tumor site despite careful surgical removal of the tumor correlating to similar aggressive tumors in man. This mimics situations encountered in human surgical therapy although recurrence rates in humans are generally in the 10 to 40% range and not as high as observed in this mouse experiment. Importantly, as exhibited by the results of the partial tumor

removal, use of EPT with Bleomycin is associated with substantial reduction in tumor recurrence even if the surgical procedure failed (in this case on purpose) to excise all of the tumor mass. Further, the route of administration does not appear to play a significant role in efficacy in that administration by i.v. and i.t., respectively, produced similar results. Further still, the efficacy effect was surprisingly provided even after a 15 minute interval between completion of Bleomycin-EP treatment and tumor excision. The data are further supportive of the treatment methods in effectively treating microtumor seeding in the tissue in that the experiment wherein EP was only partially performed without tumor removal, i.e. the effective electrical field was off-centered from the tumor. Here, there was still 67% efficacy indicating there was at least a microregional effect caused by the EPT. In this example study cohorts for testing Bleomycin administration alone without EP or vice versa (i.e. EP without Bleomycin) were not included as Bleomycin administration without EP is known to have no significant antitumoral activity.

[0085] With respect to the tumor cells introduced into the test animals, we allowed the tumor masses to grow to relatively large size. See FIGS. 11A, 12A, 13A and 14A which represent tumors in test animals prior to treatment. FIGS. 11B and 12B represent examples of surgical tumor removal at the stage of having the tumor exposed before the final excision. FIGS. 11C, 12C, 13B, and 14B represent examples of the wound after complete tumor removal prior to Bleomycin-EPT (FIG. 12C) or saline-sham EP treatment (FIG. 11C), or after partial tumor removal prior to saline-sham treatment (FIG. 14B), or 15 minutes after i.t. Bleomycin-EPT (FIG. 13B).

[0086] FIG. 11D shows recurring tumor after complete tumor excision and saline-sham EP treatment and FIG. 14C shows recurring tumor after partial tumor excision and saline-sham EP treatment. FIGS. 12D and 13C show tumor sites free of tumor after tumor excision and treatment with i.v. Bleomycin and EP, or treatment with i.t. Bleomycin and EP with subsequent partial tumor excision, respectively. These procedures have advantages over present standard procedures that treat cancers with anticancer drug i.t. or i.v. Excision of the tumor, either prior to or after drug-EPT treatment prevents formation of a large necrotic mass at the tumor site which the body has to resorb or otherwise eliminate, which empirically takes at least several weeks and enhances the probability of complications. Removal of the